

## SOCIAL CONTROL IN THE PSYCHOLOGICAL EXPERIMENT: ANTISOCIAL BEHAVIOR AND HYPNOSIS<sup>1</sup>

MARTIN T. ORNE AND FREDERICK J. EVANS<sup>2</sup>

*Pennsylvania Hospital, The Institute, Philadelphia, and University of Pennsylvania*

Rowland and Young found that hypnotized Ss were willing to carry out such apparently antisocial actions as grasping a dangerous reptile, plunging their hand into concentrated acid, and throwing the acid at an assistant. However, only informal attempts were made to show that the Ss perceived the acts as dangerous, or to demonstrate that the requested behavior exceeded the broad limits of social control implicit in the context of a psychological experiment. The experiment conducted by Young was replicated exactly, and his results confirmed. However, nonhypnotizable Ss simulating hypnosis to a "blind" E, and even normal, waking control Ss, complied with the same requests. Ss invariably reported they were convinced the activities were safe because they were participating in research conducted by competent, responsible scientists. It is concluded that the tasks were perceived by Ss as being within the limits of legitimate requests made in an experimental context. The present study does not answer the question whether antisocial behavior can be elicited under hypnosis. However, it demonstrates the nature of control groups essential for a valid test of the antisocial hypothesis, and illustrates the broad range of behavior legitimized in an experimental context.

### SOCIAL CONTROL IN THE PSYCHOLOGICAL EXPERIMENT

There has been increasing awareness by behavioral scientists that the subject in an

<sup>1</sup>This study was conducted at the University of Sydney, Australia, during a visit by the senior author, June-August 1960. It was supported in part by Research Grant AF-AFOSR-88-63 from the Air Force Office of Scientific Research and by a grant from the Human Ecology Fund.

We wish to thank A. G. Hammer, then acting Head of the Department of Psychology, for his cooperation with the use of departmental facilities. We wish to express our appreciation to the Departments of Chemistry and Biochemistry, University of Sydney, and the Radiology Department of the Royal Prince Alfred Hospital, Sydney, for donating equipment. We are indebted to the Department of Zoology, University of Sydney, for loaning the harmless reptiles. We are particularly indebted to Fred Matthews, herpetologist, for his willingness to loan, tend, and handle the venomous reptile throughout the study. Without his generous help this study would not have been completed.

We are appreciative of the valuable comments made during the preparation of this report by Peter B. Field, Lawrence A. Gustafson, Ulric Neisser, Donald N. O'Connell, Emily C. Orne, and Ronald E. Shor. We also wish to thank Eleanor DeRubeis for her valuable editorial assistance.

<sup>2</sup>When the experiment was conducted the junior author was supported by a University of Sydney Research Studentship in the Department of Psychology.

experimental investigation is not a passive entity. Experimental evidence (Orne, 1959; Orne & Scheibe, 1964) has demonstrated that the subject takes an active role in interpreting the nature of the investigation and makes implicit assumptions about the hypotheses being investigated which influence his performance in the experimental situation. Nor is an experimenter free from the influence of his own investment in the hypotheses he is investigating. In a series of studies Rosenthal has shown that experimenters who have different hypotheses about the outcome of a particular experiment may obtain results which are congruent with their hypotheses (for example, Rosenthal, 1964; Rosenthal & Fode, 1963). Such studies imply that it is necessary to consider the particular nature of the special interpersonal interaction which exists between the subject and the experimenter in psychological experiments.

Orne (1960, 1962) has emphasized that the experimental context legitimizes a very broad range of behavioral requests. Subjects have implicit faith that experimenters are responsible people, that they will not be asked to carry out tasks which are devoid of meaning, and that regardless of appearances they

will not be permitted to suffer any harm because of obvious social sanctions.

In a series of informal experiments in our laboratory, it has been impossible to devise a task which the subject perceives as completely "meaningless" within the context of an experiment. For example, subjects were confronted with a stack of paper, each page containing rows of random digits. The experimenter instructed subjects to continue adding the rows of numbers successively, and after accurately completing each page, to tear it into a minimum of 32 pieces. Although subjects were given no reason to justify the task, they continued this apparently meaningless endeavor beyond the tolerance limits of the experimenters (Orne, 1962).

Frank (1944) has reported some informal experiments in which subjects continued meaningless and impossible tasks, including trying to balance a marble on a small steel ball and transferring spilled mercury to a small bottle with a wooden paddle, even when an assistant tried to prevent them from trying to complete the tasks. No justification was given for performing the tasks other than that it was an experiment.

In the same study, Frank also reported that subjects continued eating several unsavory, unsalted soda crackers for time periods in excess of what would seem reasonable for such an unpleasant task, and longer than subjects who were told they could stop eating them as soon as they wished. Shor (1962) has reported that subjects were willing to accept extremely high levels of electric shock when requested to select a level of intensity which was as high as they could tolerate for experimental purposes. Milgram (1963) has shown that subjects continue to administer what they believe are extremely high levels of electric shock, exceeding apparently dangerous levels, to another "subject" in the context of a learning experiment.

The limits of boredom, tolerance, pain, and fatigue which are accepted as reasonable requests within an experimental situation seem extremely broad. However, the actual range of social and behavioral control legitimized by the special contract implicit in the subject's agreement to participate in a psy-

chological experiment has received few explicit tests.

#### ANTISOCIAL BEHAVIOR AND HYPNOSIS

It is generally considered that a hypnotized subject relinquishes considerable social and behavioral control to the hypnotist. A subject frequently reports that he felt compelled to carry out the commands of the hypnotist; that he could not resist the suggestions made by the hypnotist. This apparent increase in the amount of social control relinquished by the hypnotized subject to the hypnotist has raised the unresolved question whether a subject can be compelled, under hypnosis, to perform apparently antisocial acts or behavior which is perceived as injurious and dangerous to self or others. Estabrooks (1943), Rowland (1939), Weitzenhoffer (1949), Wells (1941), Wolberg (1945), and Young (1952) have stated that, provided adequate techniques are used, hypnotized subjects may be compelled to carry out apparently antisocial actions, while Erickson (1939), Meares (1960), and Schilder and Kauders (1927) have disagreed with this viewpoint. The extensive literature presenting the conflicting viewpoints has been reviewed elsewhere (Barber, 1961; Orne, 1960; Weitzenhoffer, 1953). The present investigation is concerned with two studies frequently cited as evidence that hypnosis can be used to induce antisocial behavior.

*Rowland (1939).* Two deeply hypnotized subjects were asked to reach through the window of a box and pick up a large, active, diamondback rattlesnake. This request was rationalized to them by suggesting that the snake was a coil of rope. One hypnotized subject immediately complied, but was prevented from handling the snake by a pane of invisible glass. The other subject came out of the hypnotic state and refused to continue with the experiment. Another two hypnotized subjects attempted to grasp the snake, even when no attempt was made to delude them about what it was. Similarly, two hypnotized subjects were requested to throw concentrated sulphuric acid, which they had been told was very dangerous, at the face of an assistant. The two subjects complied with this request.

By way of control, forty-two persons, of every age and degree of sophistication, were asked to come to the laboratory and pick up the snake. . . . With one exception all the persons were not only badly frightened at the appearance of the snake, but would not come close to the box . . . [Rowland, 1939, p. 116].

*Young (1952).* In a replication of Rowland's study, Young asked eight deeply hypnotized subjects to carry out similar tasks. Young reported,

The results show that seven of the eight subjects would enter into a situation which unhypnotized observers shrank from, the subjects carrying out suggestions to handle snakes and throw nitric acid under conditions from which they themselves recoiled in the waking state [p. 405].

One major aim of the present study was to confirm these results by replicating in exact detail the procedures outlined by Young (1952). It is apparent from the accounts of both Rowland and Young that strong pressure was placed upon the hypnotized subjects to comply with the requested antisocial acts. However, Rowland did not exert similar pressure to comply when testing the independent, informal waking control group, nor did Young confront his hypnotized subjects with the same type of pressure in the subsequent waking condition. Consequently, it is doubtful if the informal controls used by these investigators provide any answer to the fundamental question being considered: does the degree of social control which occurs under hypnosis actually exceed the amount of social and behavioral control already existing in the experimental situation?

#### SOCIAL CONTROL, ANTISOCIAL BEHAVIOR, AND HYPNOSIS

The basic question may be formally stated: does the degree of social and behavioral control under hypnosis exceed that which is legitimized by the special social and behavioral control implicit in the experimental situation?

In order to determine that subjects have indeed been compelled to carry out any actions which they would not have carried

out without the intervention of hypnosis it must be shown that:

1. Subjects in hypnosis carry out actions which are not performed by nonhypnotized control subjects.

2. Control subjects must be treated in an identical fashion to hypnotized subjects; both in regard to explicit instructions as well as implicit cues.

If these actions are to be designated as antisocial or self-destructive it must be shown that they are perceived as such by the subjects, i.e., truly dangerous or harmful to themselves or others. The implicit cues are of crucial importance. A subject is aware of certain realities imposed by the experimental situation. It is as clear to a subject as it is to any scientist that no reputable investigator can risk injuring a subject during the course of an experiment. A subject knows that an experimenter will outline in advance any possible specific and deliberate danger which could be associated with his actual participation in a study. Consequently, any requested behavior which appears to a subject to be dangerous at face value may be reinterpreted in the context of a laboratory situation. In spite of the apparent objective danger of a task it may nonetheless be perceived to be harmless because the subject realizes that necessary precautions will be taken to avoid possible injury to him. If an apparently dangerous task is requested of a subject during an experiment the subject's compliance, or refusal, may depend on whether he perceives that he is expected, or is not expected, to carry out the task. It is particularly vital in an experiment which depends on a contrived situation to determine what the subject, in different groups, perceives about the experimental situation and what is implicitly communicated to the subject within different groups.

Even though the experimenter is extremely careful to treat all groups alike, subtle and unintentional cues may be differentially communicated by him to subjects in different experimental groups, particularly when the experimenter knows to which experimental group a specific subject belongs. These experimenter influences on results have been demonstrated in both animal (Rosenthal &

Lawson, 1963) and human research (Rosenthal & Fode, 1963).

It is essential, therefore, that the non-hypnotized control groups and the hypnotized subjects are treated in an identical manner. The real-simulating hypnosis model described by Orne (1959, 1960, 1962) provides one method of making reasonably sure that experimental and control subjects are treated alike. With this procedure both hypnotized and control group subjects are run "blind" by an experimenter, because he is not informed, and cannot readily detect, which subjects are hypnotized, and which subjects are awake but simulating hypnosis. The procedure has similar aims to those of the "blind" designs used in the evaluation of new drugs in psychopharmacology.

The real-simulator design has been adopted as the main control procedure in the present study. If both real and simulating subjects carry out behavior which is apparently anti-social or self-destructive, it would seem inappropriate to conclude that the hypnotized group was compelled to carry out these actions because of the use of hypnosis: rather, the behavior of both groups could be interpreted more parsimoniously as an appropriate response to the existing cues in the experimental situation.

In addition to the use of the crucial simulating control group, the content of social and behavioral control existing within the experimental situation was explored by including a normal waking control group. This independent waking control group was treated, as far as possible, in the same way as the hypnotized and simulating groups. An attempt was also made to demonstrate that it is possible to communicate to a subject that he should fail to carry out the apparently dangerous acts. The procedure adopted was the same as our understanding of the informal controls used by Rowland (1939). In addition, each hypnotized subject was retested in the waking condition, as his own control, similar to the control procedure of Young (1952). A parallel procedure using subjects with no previous experience with hypnosis was used as an additional waking control group.

### PROCEDURE<sup>3</sup>

#### *Selection of Subjects<sup>4</sup>*

*Hypnosis group.* Several volunteer undergraduate students were individually tested for susceptibility to hypnosis. After at least two hour-long screening sessions, six subjects were selected to participate in the study as the real hypnosis group. These subjects could readily achieve deep somnambulistic hypnosis manifesting such typical phenomena as catalepsy and rigidities, positive and negative hallucinations, posthypnotic suggestions, and complete posthypnotic amnesia.

*Simulating hypnosis group.* Another six subjects who showed no hypnotic responses during at least two extensive, individual hypnotic induction sessions participated in the study as simulators. Each simulating subject was told that he was participating in research investigating the nature of hypnosis, but he was not told that the study involved allegedly antisocial behavior. He was told that his task was to try to fool an experienced hypnotist, in an experimental setting, by pretending to be deeply hypnotized. Even though he would probably not experience or produce any real hypnotic response, he was to act as if things were happening just as the hypnotist said they would. Although the hypnotist was described as an authority on the subject, it was stressed that it was possible, though very difficult, for the subject to fool the hypnotist.

No special training or instruction about how to simulate was given to the subjects in this group, nor were they told what phenomena would be involved in the experimental session. However, each simulator had individually watched a good hypnotic

<sup>3</sup> Several procedural details have been deposited with the American Documentation Institute. This material contains additional detail about selection of subjects, choice of a venomous reptile, the effects of the nitric acid on the coin and safety procedures protecting the subject, description of the procedure for substituting the colored solution for the acid, and a scale diagram of the apparatus. Order Document No. 8203 from ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D. C. 20540. Remit in advance \$1.25 for microfilm or \$1.25 for photocopies and make checks payable to: Chief, Photoduplication Service, Library of Congress.

<sup>4</sup> One experimenter (FJE), who selected subjects, trained simulators, was assistant and observer during the study, subsequently confirmed that hypnotized subjects were amnesic for the session, that simulators experienced no real effects of the hypnotic induction and suggestions, and conducted postexperimental inquiries. The second experimenter (MTO) induced hypnosis for the main session, conducted the five groups in the experimental procedure, and at the completion of each subject's experimental participation, conducted a further independent inquiry after being informed which were real and simulating subjects.

subject being hypnotized, demonstrating motor and challenge suggestions, simple positive hallucinations, amnesia, and posthypnotic suggestion.

*Additional control groups.* Six subjects, who did not meet the criteria for either good hypnotic subjects or simulators, formed one of the additional control groups. The remaining two control groups contained subjects recruited from the student population who did not know the experiment also involved hypnosis.

### Experimental Procedure

The experiment follows the procedure described by Young (1952) as closely as possible.<sup>5</sup>

Hypnosis was induced in a room adjacent to the experimental room. After the induction of hypnosis the subject was led, with eyes closed, into the experimental room and seated in front of a large wooden box which stood on a table.

The box was divided into two compartments by a removable partition. The subject could easily reach into the front compartment through a window. A sheet of plate glass could be raised or lowered silently across the window, sliding along felted grooves. The compartment was illuminated by two concealed lights, so that no light was reflected directly onto the surface of the glass. The two lights were the only source of illumination in the room. From the position of the subject it was not possible to detect the presence of the glass.<sup>6</sup>

<sup>5</sup> We are indebted to P. C. Young for his kindness in providing an unpublished manuscript describing apparatus and procedure in detail and for clarifying further details in private communications (1959).

<sup>6</sup> The invisibility of the glass was attested by the following: (a) Inability of the experimenters to detect if the glass was in position unless they had prior knowledge of its position. (b) The witness and bruised knuckles of several members of the Department of Psychology whose curiosity got the better of them. (c) The expressed concern of a graduate student when watching a subject reach for the snake. Although he knew about the glass screen, and although he had been watching closely, he did not see the screen being lowered. (d) Only one subject in a subsequent inquiry reported detecting the glass. This happened because of the forgetfulness of the experimenters who failed to clean the window before this particular subject was tested. Most subjects expressed spontaneous surprise if, and when, they discovered the glass in their attempts to grab the snake, often making exploratory movements across the surface of the window.

Elizabeth Erickson (1962) has argued that visual acuity may increase under hypnosis; hence, hypnotized subjects would detect the presence of the glass. This hypothesis would be relevant if clear-cut differences were found between the hypnotized group and other crucial groups in the willingness to comply with requests to perform the antisocial activities.

### Behavior Requested of the Subject

*Inanimate objects.* The hypnotist suggested that the subject would have an irresistible urge to do whatever the hypnotist told him. The subject was then asked to open his eyes, to reach into the compartment, to pick up and identify objects he saw there, and to place them in a bag held by the hypnotist. A two-shilling coin, then a piece of chalk, were placed in the compartment. All subjects identified and removed these objects.

*Harmless reptiles.* The subject was then told that a harmless, live reptile would be placed into the compartment. A thick-tailed gecko lizard (*Gymnodactylus milii*) was placed in the compartment. When the lizard had been removed, a thin, 14-inch long, harmless, green tree snake (*Ahaetulla punctulata*) was lowered into the compartment.

The remaining three activities described below objectively appeared to be dangerous or harmful, either to the subject himself, or to a third person present in the room.

*Venomous snake.* An assistant wearing long, thick, X-ray gloves placed a 14-inch long venomous snake into the compartment. The reptile, popularly known as the red-bellied black snake (*Pseudechis porphyriacus*), is generally considered to be one of the two most venomous snakes found in Australia, capable of inflicting a mortal wound if the victim is not treated immediately upon being bitten.

The hypnotist asked the subject to pick up the snake carefully about its middle, and place it in the bag. Unknown to the subject, the glass screen had been lowered silently across the window. If an attempt was made to grasp the reptile, the subject struck his hand firmly against the glass.

*Coin in acid.* The screen, and the snake, were removed. The subject then watched the hypnotist pour fuming concentrated nitric acid (15 molar) in a small, shallow, Pyrex glass beaker. After watching the acid actively dissolve a copper-alloy half-penny coin for approximately a minute, the subject was asked to remove the coin from the beaker as quickly as possible with his bare hand, and then to plunge both hand and coin into a nearby basin of soapy lukewarm water.

*Throwing acid.* The experimenter stood between the subject and the box as he carefully washed the subject's hand. While the subject was distracted, the acid was replaced with an identical beaker containing a harmless, colored solution which was the same color as the acid. The subject was similarly distracted if he did not remove the coin, so that changing the solution was not observed.

The central partition in the box was removed, exposing the assistant who had been responsible for recruiting and training the subject, sitting at the opposite end of the open-ended box. The hypnotist suggested assertively that the subject was very angry with the assistant for placing him into the unpleasant situation of the experiment. The subject was told he felt so angry that he would have an irresistible urge to throw the acid firmly into

the face of the assistant and authoritatively told to pick up the acid and throw it.

### *Postexperimental Interview*

The subject was taken back into the adjoining room, and hypnosis was terminated. Comprehensive interviews were conducted with each subject to allow him to express his subjective reactions to the experiment, and his thoughts and comments about the experiment. Appropriate questions were asked to establish that the subject had remained amnesic throughout the experimental session, or, in the case of simulators, to confirm that no trance effects occurred during the experiment.

### *Treatment of Experimental Groups*

The procedure has been outlined as it was encountered by the subjects in the hypnosis group. The hypnotized group of subjects was subsequently retested in the waking state, while still amnesic for the hypnosis session, and an additional four groups were tested.

For clarity of exposition a detailed statement of the aims of testing each group will be presented below in the Results section. General modifications in the experimental procedures for the respective waking control groups will be quite apparent. The procedures outlined above were followed either exactly, or as approximately as the nature of the specific groups would allow. The major difference between groups was the manner and attitude of the experimenter, and the subtle means whereby expectations of compliance or noncompliance with the apparently antisocial actions were conveyed. Differences in the approach of the experimenter, in terms of the aims and purpose of each group, will be discussed as the results for each group are being presented.

There was, of course, no difference in the treatment of the hypnotized subjects and simulating subjects because the hypnotist remained unaware of the subgroup membership of these subjects throughout the experiment.

### RESULTS

The number of subjects in each group who attempted to comply with the requested tasks is summarized in Table 1. A detailed analysis of the responses of each subject within the various groups is presented in Table 2, together with ratings of the degree of subjective involvement in the tasks. The latter ratings were made by the assistant who was aware of the group membership of hypnotized and simulating subjects, and must be interpreted accordingly.<sup>7</sup>

<sup>7</sup> The data presented in Tables 1 and 2 are not amenable to further statistical analysis. There is a partial experimental dependence of the tasks because of the way in which they were, of necessity, presented to the subject. Consequently, neither treating each antisocial action as a separate activity, nor the alternative of tabulating the number of acts actually attempted by each subject, is a valid method of treating the data statistically. Even if either alternative were possible, the analysis of frequency data, preferably by exact probability procedures, requires the determination of the expected frequencies of occurrence. Hypothetical expected frequencies of six subjects in any group successfully attempting each act could be defended as readily as hypothetical expected frequencies of no subject in any particular group attempting each act. Even the statistical determination of expected frequencies from marginal entries has limited merit in groups of this size, for this would impose a level of precision on the data which is not warranted, as well as limiting the possibility of finding statistically significant differences. However, this does not reflect upon the size of the groups, for the experimental rationale is such that the mere occurrence of apparently antisocial behavior is significant if it occurs in the crucial simulating control group. The aim of the study is, in a real sense, to demonstrate the truth of the null hypothesis: to demonstrate that specially designed groups do not differ in their propensity to respond in a defined manner.

TABLE 1  
FREQUENCY OF ATTEMPTS TO CARRY OUT APPARENTLY ANTISOCIAL ACTS

Group <sup>a</sup>	Grasp harmless reptiles <sup>b</sup>	Grasp venomous snake	Take coin from acid	Throw acid at assistant
1. Real hypnosis	5	5	5	5
1a. Retest real, as waking control (Young)	X	2	3	2
2. Waking control: press for fail (Rowland)	6	3	1	1
3. Simulating hypnosis	6	6	6	6
4. Waking compliance control	5	3	5	5
5. Waking control: eliminate "shaping" procedures	X	2	3	2

<sup>a</sup> Six subjects in each group; see text for description of groups.

<sup>b</sup> Includes small lizard and harmless snake. Two subjects refused both. Eliminated from procedure in waking retest of Group 1a and Group 5.

TABLE 2  
ANALYSIS OF ATTEMPTS TO CARRY OUT APPARENTLY ANTISOCIAL ACTS FOR EACH SUBJECT

Group and subject	Sex	Grasp harmless reptiles <sup>a</sup>	Grasp venomous snake <sup>b</sup>	Take coin from acid <sup>b,c</sup>	Throw acid at assistant <sup>b,d</sup>
1. Real hypnosis					
JB	F	Yes	Yes (H)	Yes (H)	Yes (A, T)
YM	F	Yes	Yes	Yes (A)	Yes (A, T)
GP	M	Yes	Yes	Yes	Yes (T)
CW	F	Yes	Yes	Yes	Yes
EB <sup>e</sup>	F	No	—	—	—
SM	F	Yes	Yes	Yes (U)	Yes
1a. Retest real hypnosis subjects in waking state (Young control) <sup>f</sup>					
JB	F	—	No	No	No
YM	F	—	No	Yes (H)	Yes (A, T)
GP	M	—	No	Yes (H)	No
CW	F	—	Yes (H)	Yes (H)	Yes (A, T)
EB <sup>e</sup>	F	—	—	—	—
SM	F	—	Yes	No	No
2. Waking control: press for failure (Rowland control)					
RF	M	Yes	Yes	Yes	Yes (H, V)
JF	F	Yes	Yes (A)	No	No
DF	M	Yes	No	No	No
PH	M	Yes	Yes (H)	No	No
HH	F	Yes	No	No	No
EC	F	Yes	No	No	No
3. Simulating hypnosis					
KM	F	Yes	Yes (H)	Yes (A, U)	Yes (V)
RW	F	Yes	Yes	Yes	Yes (T)
ST	F	Yes	Yes	Yes (H, U)	Yes (A, T)
JJ	M	Yes	Yes	Yes	Yes (V)
MF	M	Yes	Yes (H)	Yes (H, U)	Yes (H)
AT	M	Yes	Yes	Yes (H, U)	Yes (V)
4. Waking compliance control					
FP	F	No	No	No	No
JM	F	Yes	No	Yes (H)	Yes (H)
RS	M	Yes	No	Yes (A)	Yes (H)
PP	M	Yes	Yes (H)	Yes	Yes
AL	M	Yes	Yes	Yes	Yes (V)
FJ	M	Yes	Yes	Yes (A)	Yes (V)
5. Waking control: elimination of "shaping" procedures					
IR	F	—	Yes (H)	Yes	Yes (H)
NG	M	—	No	Yes (H)	No
RM	M	—	Yes	Yes (H)	Yes
RE	M	—	No	No	No
MA	F	—	No	No	No
CR	F	—	Yes (?) <sup>g</sup>	No	No

Note.—Yes = attempt to carry out requested activity; No = refused to carry out requested activity.

<sup>a</sup> Gecko lizard and harmless snake. Procedures omitted for Groups 1a and 5 (see text).

<sup>b</sup> H = hesitant in attempting task; A = agitation and emotional involvement markedly apparent.

<sup>c</sup> U = unsuccessful in removing coin, but attempted to extent of placing fingers in acid.

<sup>d</sup> T = tentative throw, hardly splashing assistant; V = violent throw, for example, hurling solution and container.

<sup>e</sup> Subject almost hysterical at sight of lizard; remaining activities omitted. Counted failure (see Footnote 8).

<sup>f</sup> Hypnosis-group subjects retested.

<sup>g</sup> Subject reported detecting glass screen at end of experiment (see Footnote 6).

### Replication of Results of Rowland (1939) and of Young (1952)

#### Real Hypnosis: Group 1

**Treatment.** The hypnotist told the subject that he had an irresistible urge to carry out

easily and readily all suggestions given to him. Each activity was preceded by a firm statement—"I want you to . . ." The apparent dangers in the venomous reptile and acid situations were stressed. The experimenter

conveyed by his verbal tone and nonverbal manner and attitude that he expected compliance. Further pressure and persuasion were adopted if the subject showed hesitancy about carrying out any of the activities.

After the experimental tasks were completed, hypnosis was terminated. A careful evaluation of the validity of the suggested complete amnesia for the session was made, and depth of hypnosis was checked by testing a posthypnotic suggestion administered by the hypnotist at the completion of the experimental tasks.

**Results.** Five of the six hypnotized subjects carried out all of the suggested activities.<sup>8</sup> The major result of the earlier studies of Rowland (1939) and Young (1952) was thus replicated: hypnotized subjects will carry out apparently antisocial and injurious activities such as handling dangerous reptiles and concentrated acid.

#### *Hypnosis Subjects Retested as Own Control (Young, 1952): Group 1*

**Treatment.** The five subjects in the real hypnosis group who had carried out the actions returned the following day. Each subject was asked, in the waking state, whether he would be willing to carry out the suggested activities involving the snake and acid. This was the control measure carried out by Young (1952). Although the verbal content of the request implied the possibility of compliance, it was conveyed by the experimenter's general manner and nonverbal behavior that compliance with the request was not necessarily expected.

**Results.** As found by Young (1952), and as expected in the present study, subjects generally refused to carry out the actions in the waking state, even though they had been quite willing to carry them out in the hypnotic condition. However, two subjects could

<sup>8</sup> The remaining subject became emotionally disturbed at the sight of the harmless lizard and it was not possible to administer the remaining tasks. As the subject had passed the selection criteria, it was decided not to replace her. It is noted that she was one of the two hypnotic-group subjects whose previous experience with the experimenters was minimal, and it is possible that the interpersonal relationships existing were not as strongly developed as with other subjects.

be persuaded to attempt to pick up the venomous snake and to throw the acid at the assistant. Another subject removed the coin from the acid.

Amnesia for the previous day's hypnotic experience was again confirmed, and was then removed. Subjects reported that under hypnosis they felt more passive, were not particularly concerned with the consequences of their actions or what safeguards existed, and generally were less disturbed by the situation than they were in the waking state. The subjects who attempted any of the activities claimed they were much more hesitant in the waking state than they had been in the previous hypnotic state. These reported differences were consistent with the observer's ratings of such differences between the two performances, summarized in Table 2.

#### *Waking Control Used by Rowland (1939): Group 2*

**Treatment.** As far as could be ascertained, the six subjects in this group were treated similarly to the informal control group in Rowland's (1939) study.

The experimenter implicitly communicated the expectation that the subject would refuse to carry out the requested activities. The apparent danger was stressed at least as much as it was with subjects in other groups. The request to carry out the various actions was phrased more in the form of a question of whether he would be willing to comply with such obviously dangerous actions. However, persuasion and pressure were applied if a subject refused to carry out any activity, although not as insistently as for subjects in the hypnotized and simulating groups.

**Results.** Three of the six subjects in this group attempted to pick up the snake, but only one of them attempted to take the coin from the acid, and throw the acid at the assistant, both after considerable hesitation. It had been expected that subjects in this group would refuse to carry out the activities.<sup>9</sup> Some subjects could be persuaded to

<sup>9</sup> It was frequently noted in the records made by the assistant that the experimenter exerted more pressure with subjects in the three control groups in which noncompliance was predicted than our understanding of the parallel procedures of Row-

carry out the tasks. It appears that either the experimenter could not refrain from being more insistent than Rowland, or the psychological experiment is more institutionalized for University of Sydney students in 1960 than it was for University of Tulsa students in 1939.

*Summary of Attempted Replication of Studies of Rowland (1939) and Young (1952)*

The results obtained from the three groups reported in the present study are in substantial agreement with the findings reported by Rowland and by Young. Their results, as far as comparisons are relevant, have been confirmed, and their procedure has been replicated successfully.

*Limits of Social and Behavioral Control in the Experimental Situation*

Rowland and Young concluded from their data that hypnosis was instrumental in producing antisocial and dangerous behavior which could not be elicited otherwise. However, these results cannot answer the fundamental question of whether the apparently antisocial behavior elicited under hypnosis exceeds the limits of behavior which may be legitimized by the experimental situation per se. To answer this question, it is necessary to test whether the request to carry out the apparently antisocial and self-injurious acts exceeds the limits of social and behavioral control implicitly existing in the experimental situation.

*Simulators: Group 3*

*Treatment.* Because the experimenter did not know whether he was testing a hypnotized or a simulating subject at any time, both the hypnotized and simulating groups of subjects were treated alike, and were exposed to the same demand characteristics concerning compliance with the experimenter's requests. Consequently, compliance with the requests of the experimenter by the simulators would indicate that the requested be-

---

land and Young warranted. The excessive persuasion was not intended: we do not know if this accounted for the unpredicted successful attempts in these groups.

havior is within the limits of what they perceived as legitimate and reasonable within the experimental context. Such a result would demonstrate that the present tasks do not provide a test of whether hypnosis can be used to compel the subject to carry out antisocial behavior.

*Results.* All six subjects who were simulating hypnosis attempted to comply with the apparently antisocial and injurious activities requested of them. They objectively attempted to carry out the various tasks at least as readily as the subjects who were actually hypnotized.

Qualitatively, it appeared that the simulators were more hesitant than the hypnotized subjects about grasping the snake, less successful in their attempts to remove the coin from the acid, but more violent and less hesitant about throwing the acid solution at the assistant<sup>10</sup> (see Table 2).

*Waking Compliance Control: Group 4*

*Treatment.* There are special motivational aspects involved when a subject simulates hypnosis which are not present when a subject is actually hypnotized. A simulator is motivated by two special features: he must attempt to please one experimenter by striving to deceive a second experimenter. It is possible that these special motivations may increase the range of social and behavioral control implicit within the unique type of experimental situation which exists for the simulating subject.

In an attempt to evaluate this possibility, an additional set of six subjects served as the usual type of control group. They were told that they were a normal waking control group in a study employing hypnotized subjects. As far as possible, they were treated identically to the hypnosis and the simulating groups; the experimenter's manner conveyed an expectation that subjects would comply with his requests. This group differs from the

<sup>10</sup> For example, some simulators (and some members of Group 4 below) hurled both solution and container at the assistant. In comparison the hypnosis group, though throwing the solution, sometimes failed to splash the assistant with it. These subjective differences were observed by the assistant who was aware of the group membership of the subjects.

informal controls employed by Rowland (see Group 2 above) in that these subjects were treated as formal experimental subjects and compliance with the requests was taken for granted, whereas such pressure was not applied in Group 2, described above, or by Rowland.

**Results.** Five subjects attempted to carry out the two tasks involving the acid, but two of these subjects refused to handle the venomous snake. The performance of this group was only slightly inferior to that of the hypnotized and simulating groups. It would appear that consideration of the special motivations which existed for subjects simulating hypnosis is not necessarily essential to account for the present results.

#### *Elimination of "Shaping" Procedures:*

##### *Group 5*

**Treatment.** It is possible that the preliminary tasks, taking inanimate objects from the compartment and handling harmless reptiles, could operate as a type of "shaping" or "conditioning" procedure, gradually leading the subject to tasks which in themselves look frightening, but in the context of the "shaping" procedure lose much of their fearsome potency.

A separate waking control group was conducted without the preliminary harmless tasks. These subjects were asked to participate in a psychological experiment, but they were not told that they were controls in a study involving hypnosis. Apart from the elimination of the innocuous tasks, the procedure was essentially the same as for Group 2. Unfortunately, the pressure exerted to gain compliance was generally greater than it was for Group 2.<sup>11</sup>

<sup>11</sup> There was some confusion between the two experimenters when subjects in this group were being tested. While the experimenter was testing some subjects in this group, the relevant question was seen as to whether expectation of failure could be as readily communicated with and without the preliminary "shaping" procedures, in which it was predicted the results would be similar to Group 2. For other subjects the question was implicitly seen as whether subjects would comply as readily with the tasks when the innocuous tasks were eliminated compared to the ease of gaining compliance when they were included. It was predicted from this viewpoint that results would be similar to Group 4, and

**Results.** Two subjects attempted to handle the snake and to throw the acid, and a third subject attempted to take the coin from the acid. The results are somewhat equivocal, but it appears that the "shaping" procedure employed is not an essential determinant of subsequent behavior.

#### *Informal Controls*

A number of colleagues were informally shown the experimental tasks. These faculty members were treated in a fashion similar to the treatment of the control group used by Rowland (1939).

They invariably refused to carry out even the least objectionable of these three tasks, the removal of the penny from the nitric acid. The fellow faculty members who were asked to perform these tasks could not be pressured or persuaded in any way to undertake them. It is significant that their behavior was identical to that of Rowland's informal control group.

Two aspects appear relevant in interpreting these informal observations:

1. The faculty members were not in a formal experimental situation.

2. A different role relationship existed between faculty members and the experimenters compared to that existing between subjects and experimenters. These differences emphasize the importance of the special contexts provided by the combined subject-experimenter relationship and the nature of the experimental situation in terms of the willingness of the subjects to carry out the experimental tasks.

#### *Postexperimental Inquiry*

With few exceptions, subjects who attempted to carry out the requested activities reported in the postexperimental inquiry that they felt quite safe in the experimental situa-

even the simulating subjects, Group 3. Clearly two separate groups should have been tested. It is certain that some subjects within this group were treated quite differently from others. The confusion was not recognized until after the completion of the study, and it is not known to what extent the equivocal results are concordant with the differing expectations that were undoubtedly induced. The results for the group are reported only for the sake of completeness.

tion. Though they reported feeling rather uncertain about the tasks, and reported strong emotional reactions to the repugnant activities, the subjects reported that they were quite convinced that they would not be harmed *because* the context was an experimental one, presumably being conducted by responsible experimenters. All subjects appeared to assume that some form of safety precautions had been taken during the experiment. Although no subject reported suspecting the presence of a glass screen, subjects felt that the snake had either been milked of its venom or defanged. Some felt that the solution was not really acid, even when they plunged their hand into it; others suspected the assistant could duck in time to avoid the acid; or the glass screen would be in place again (having previously discovered its presence during the procedure with the snake); or perhaps the assistant would even plunge himself into a nearby tub of water; or in one case, that the assistant was not actually there—it was an illusion produced by a complex arrangement of mirrors.

#### DISCUSSION

1. No conclusions can be drawn from the present investigation about the potential use of hypnosis to induce antisocial behavior. However, the study clarifies conclusions which may be drawn from two previous studies. After replicating the studies by Rowland (1939) and Young (1952) and confirming their results, it has been shown that similar apparently antisocial behavior can be elicited in control groups treated in an identical fashion to a group of hypnotized subjects. The apparently antisocial actions were also carried out successfully by subjects who were not hypnotized, indicating that the tasks are within the broad range of activities which are perceived as legitimized by the nature of the situation: they were requests made by experimenters, viewed by subjects as responsible scientists, in the context of a psychological experiment.

2. The present study is essentially methodological, demonstrating experimental conditions which are necessary to investigate the antisocial hypothesis. The burden of demonstrating the production of antisocial behavior

by hypnotic techniques lies with the investigator, who must demonstrate that the so-called antisocial behavior does exceed that which is legitimized by the experimental situation, and that the behavior is perceived by the subject as truly dangerous or anti-social. It is our belief that it may not be possible to test the antisocial question in an experimental setting because of the problems of finding tasks which are not seen as legitimized by the experimental context.

3. It may seem surprising that the waking control group subjects who were pressed to comply with the apparently dangerous behavior were quite willing to follow the experimenter's commands. This confirms the anecdotal evidence reported above from our own laboratory: we still have not found an aspect of behavior which is sufficiently safe to request of a subject, and which a subject will refuse to carry out if the expectation of compliance is communicated to him. In the present study the experimenter could virtually predetermine the nature of the resulting behavior by deciding in advance whether he would *consciously*, but subtly, communicate to a subject an expectation either of failure or of compliance. Such a result is concordant with other findings (for example, Rosenthal, 1964) showing the relative ease with which an experimenter *may* nonconsciously bias the results of a study by subtly communicating his own expectations and hypotheses.

Failure to gain compliance with hypnotized subjects would indicate inadequate replication of the exact details of Young's investigation. Because the experimenter is unaware of the group membership of real and simulating subjects outcome-bias should not differentially affect performance of subjects in these two crucial groups. It is partly because of the problem of outcome-bias that simulating subjects are included as the crucial control group.

4. The purpose of the simulating group was to examine whether the chosen behavior exceeded the limits of behavior legitimized by the special nature of the experimental context. The waking control subjects (Group 4) also complied with the requested activities, and in this sense the simulating subjects were not essential to demonstrate that the alleged

antisocial actions were within the realm of what subjects accept as reasonable requests in the experimental situation. However, the simulating group of subjects cannot be eliminated from future investigations of this type. It is not always possible to determine whether waking control subjects have been treated differently from the nonhypnotized subjects, even though an experimenter is not aware of such differential treatment.

5. The present investigation demonstrates the misleading conclusions that may be drawn when casual, informal "control" groups, of the type employed by Rowland (1939) and Young (1952), form the basis for evaluating experimental performance. It cautions against making untested assumptions about the way in which subjects will behave in an experimental situation, or making assumptions about what aspects of behavior are within the repertoire of the subjects, however reasonable these assumptions may appear, when subjects are participating in the social phenomenon known as "the psychological experiment."

#### REFERENCES

- BARBER, T. X. Antisocial and criminal acts induced by "hypnosis": A review of experimental and clinical findings. *Archives of General Psychiatry*, 1961, 5, 301-312.
- ERICKSON, ELIZABETH M. Observations concerning alterations in hypnosis of visual functions. *American Journal of Clinical Hypnosis*, 1962, 5, 131-134.
- ERICKSON, M. H. An experimental investigation of the possible anti-social use of hypnosis. *Psychiatry*, 1939, 2, 391-414.
- ESTABROOKS, G. H. *Hypnotism*. New York: Dutton, 1943.
- FRANK, J. D. Experimental studies of personal pressure and resistance: I. Experimental production of resistance. *Journal of General Psychology*, 1944, 30, 23-41.
- MEARES, A. *A system of medical hypnosis*. Philadelphia: Saunders, 1960.
- MILGRAM, S. Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 1963, 67, 371-378.
- ORNE, M. T. The nature of hypnosis: Artifact and essence. *Journal of Abnormal and Social Psychology*, 1959, 58, 277-299.
- ORNE, M. T. Antisocial behavior and hypnosis: Problems of control and validation in empirical studies. Paper presented at Colgate Symposium on Hypnosis, Colgate University, April 1960. (In G. H. Estabrooks [Ed.], *Hypnosis: Current problems*. New York: Harper & Row, 1962. Pp. 137-192)
- ORNE, M. T. On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, 1962, 17, 776-783.
- ORNE, M. T., & SCHEIBE, K. E. The contribution of nondeprivation factors in the production of sensory deprivation effects: The psychology of the "panic button." *Journal of Abnormal and Social Psychology*, 1964, 68, 3-12.
- ROSENTHAL, R. Experimenter outcome-orientation and the results of the psychological experiment. *Psychological Bulletin*, 1964, 61, 405-412.
- ROSENTHAL, R., & FODE, K. L. Psychology of the scientist: V. Three experiments in experimenter bias. *Psychological Reports*, 1963, 12, 491-511.
- ROSENTHAL, R., & LAWSON, R. A longitudinal study of the effects of experimenter bias on the operant learning of laboratory rats. *Journal of Psychiatric Research*, 1963, 2, 61-72.
- ROWLAND, L. W. Will hypnotized persons try to harm themselves or others? *Journal of Abnormal and Social Psychology*, 1939, 34, 114-117.
- SCHILDER, P., & KAUDERS, O. Hypnosis. (Trans. by S. Rothenberg) *Nervous and Mental Disease Monograph Series*, 1927, No. 46.
- SHOR, R. E. Physiological effects of painful stimulation during hypnotic analgesia under conditions designed to minimize anxiety. *International Journal of Clinical and Experimental Hypnosis*, 1962, 10, 183-202.
- WEITZENHOFFER, A. M. The production of antisocial acts under hypnosis. *Journal of Abnormal and Social Psychology*, 1949, 44, 420-422.
- WEITZENHOFFER, A. M. *Hypnotism: An objective study in suggestibility*. New York: Wiley, 1953.
- WELLS, W. R. Experiments in the hypnotic production of crime. *Journal of Psychology*, 1941, 11, 63-102.
- WOLBERG, L. R. *Hypnoanalysis*. New York: Grune & Stratton, 1945.
- YOUNG, P. C. Antisocial uses of hypnosis. In L. M. LeCron (Ed.), *Experimental hypnosis*. New York: Macmillan, 1952. Pp. 376-409.

(Early publication received June 9, 1964)